on Atmospheric Circulation": Flatey, Siglufjore, Skagerstrand.

CLIMATE OF BRITISH EAST AFRICA.

A recent British Colonial Report (Annual, No. 475) contains the following sketch of the climate of the British East Africa Protectorate:

Climatically, British East Africa, which extends approximately from 5° south to 4° north latitude, may be divided into three zones:

1. *The coast.*—The coast strip, including the valleys of the three principal rivers, the Sabaki, the Tana, and the Juba. This is essentially tropical. The atmosphere is always charged with a considerable amount of moisture, but the temperature is equable and never very high. From June to December, during the prevalence of the southwest monsoon, residence on the coast is far from unpleasant, and although it is hotter during the other six months of the year, the nights are always fairly cool. On the whole the health of the coast belt is good; there is very little malaria, and yellow fever—the scourge of the tropical coasts of the Western Hemisphere—is unknown. Farther inland, in the scrub country and in the river valleys, the effect of the sea breeze is lost, and the climate is hotter and less agreeable. Malaria is also more common, but can not be said to be very prevalent or of a severe type.

2. *The highlands.*—Leaving the coast belt a gradual rise is experienced till an altitude of 9000 feet above sea level is reached on the Mau, or 18,000 on snow-clad Mount Kenia. On the whole of these uplands the climate is excellent, healthy, and invigorating. Although the sun is fairly strong in the middle of the day, European clothing can be worn all the year round, and the nights are cold enough to render the use of two or more blankets indispensable. The fact that children born and bred on these high plateaux grow up rosy and robust is sufficient evidence of the excellence of the climate.

3. *The district around Lake Victoria Nyanza.*—From the highlands a somewhat rapid descent is made to the depression in which lies Lake Victoria. This is 3680 feet above sea level, and a tropical climate is again met with. It is hot, and owing to the vicinity of high hills thunderstorms are of frequent occurrence. The climatic conditions are less favorable [to health], and at certain seasons of the year malarial and hæmoglobinuric fevers are not infrequent.

TABLE 1.—*Rainfall summary, British East Africa, 1896–1904.*

Station.	Length of record.	Average rainfall.	Station.	Length of record.	Average rainfall.
	Years.	*Inches.*		*Years.*	*Inches.*
Kismayu	9	14.66	Machakos	7	35.82
Malindi	7	36.07	Nairobi	5	36.24
Takaungu	6	45.55	Fort Hall	4	48.21
Mombasa	6	51.95	Eldama Ravine	2	37.80
Shimoni	8	56.28	Mumias	5	73.42
Mwatate	2	22.66	Kisumu	2	51.23

CLIMATE OF TULAGI, SOLOMON ISLANDS.

From the latest colonial report on British Solomon Islands (annual, No. 461), we extract the following table of rainfall as recorded at the government station at Tulagi, together with a brief sketch of the climate.

TABLE 2.—*Rainfall of Tulagi, Solomon Islands, 1897–1905.*

Month.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	Mean: 1898–1904.
January	.....	9.51	14.27	12.20	10.93	18.31	3.96	14.78	5.62	11.99
February	.....	28.55	12.04	3.09	12.46	27.76	14.12	17.61	21.20	16.52
March	.....	27.89	17.47	13.48	10.83	22.39	10.73	23.49	.....	18.04
April	.....	6.67	20.48	2.29	6.75	8.53	5.68	6.75	.....	8.16
May	.....	4.19	8.85	5.83	17.59	4.55	3.84	10.77	.....	7.95
June	.....	4.86	1.26	3.20	10.69	7.85	7.99	2.12	.....	5.42
July	.....	4.86	24.27	3.24	5.53	9.02	7.79	4.32	.....	8.43
August	.....	9.94	8.33	3.01	13.24	14.70	14.28	8.91	.....	10.34
September	.....	10.53	10.92	5.41	10.35	6.25	10.03	5.53	.....	8.44
October	2.91	10.23	11.21	9.12	15.60	6.65	10.39	7.01	.....	10.03
November	5.66	21.14	7.89	10.62	7.97	6.83	10.69	3.35	.....	9.78
December	11.03	8.97	19.03	10.83	11.91	9.86	16.76	6.00	.....	11.91
Year	.....	147.39	156.02	82.33	133.85	142.70	116.26	110.64	.....	127.03

It will be gathered from the table that the months from December to March, the season of the northeast monsoon, are the wettest, and that the months from April to September, the season of the southeast trade wind, are those during which less rain falls. No period of the year can, however, rightly be called a dry season. June appears to be the month when least rain is to be expected. The septennial average for July is affected by the abnormal rainfall for that month recorded during the year 1899, when about 17 inches of rain fell in two days. This appears to have been an altogether exceptional phenomenon. The comparatively small total for the year 1900 is remarkable when compared with the annual totals for the remainder of the septennial period.

The southeast trade-wind season may be said to set in during March or April and to continue until November. During the months from November to March long periods of calm weather are experienced, varied by westerly and northwesterly winds, which sometimes blow with considerable force; but cyclonic storms, such as prevail during this season in more southerly latitudes, are unknown in the Solomons.

In the absence of proper instruments it has been impossible to keep any record of temperature or barometric pressure. A thermometer on the veranda at the government residence at Tulagi, about 220 feet above sea level, has never recorded a lower night temperature than 73° F., and during the cooler months, June to September, rises to about 86° to 88° during the day. During the hot months, December to February, a temperature of 92° has occasionally been observed when the heat has not been tempered by a breeze off the sea.

THE CLIMATE OF SEISTAN.

Col. Sir Henry McMahon, head of the British Seistan Mission of 1903–5, contributes some interesting notes on the climate of that region to the September and October, 1906, numbers of the Geographical Journal.

Seistan, as Lord Curzon has recently remarked, is "famous for a wind, the most vile and abominable in the universe".

Colonel McMahon says:

If ever a country merits the title of "land of the winds" it is Seistan. Everyone who has visited Seistan, or written about Seistan, has mentioned its celebrated wind, called the "Bad-i-sad-o-bist roz", or wind of 120 days, which blows in the summer. Few of these have had the misfortune to experience it, but as we went through two seasons of this wind we are able to say something about it. It more than justifies its reputation. It sets in at the end of May, or the middle of June, and blows with appalling violence and with little or no cessation till about the end of September. It always blows from one direction, a little west of north (between 316½° and 333¾°), and reaches a velocity of over 70 miles an hour. It creates a pandemonium of noise, sand, and dust, and for a time gets on one's nerves; but it is in reality a blessing in disguise, for it blows away the insects, which from April to June make life in Seistan a perfect purgatory, mitigates the awful summer heat, and clears the country of typhus, smallpox, and other diseases rife in the country in May and June. This Bad-i-sad-o-bist roz is not felt in the mountainous country west and northwest of Seistan. It is said to be even more violent in Lash Jowain than in Seistan. It is less violent in Herat, and rapidly decreases in violence south of Seistan.

One would think this 120-day wind enough, but violent winds prevail all through the winter from December to April, and blizzards are of constant occurrence. These winds always come from the same direction. The winter blizzards are terrible, and the wind attains a terrific velocity. In a blizzard at the end of March, 1905, the anemometers registered a maximum of 120 miles an hour. The average velocity for a whole sixteen hours was over 88 miles an hour.

The effects of the wind are everywhere visible in Seistan. Everything looks wind-swept and wind-stricken. Over the greater part of the country not a single tree exists. The present villages and habitations are all built with their backs presenting lines of dead wall on the windward side. The old ruins are oriented at exactly the same angle, on account of the wind.

The wind has buried large tracts of country under sand. Many of the old ruined towns are wholly or partly buried in sand, and this burying process goes on all the year and every year, and is covering up not only valuable lands, but inhabited villages.

Seistan has only two seasons, winter and summer; spring and autumn do not exist. One jumps within a few hours from cold winter into hot summer, and from hot summer into cold winter. The summer lasts from April to November, seven months, and is a long weary period of cloudless sky and great heat, which reaches a maximum in the shade for many months of 110° to 119° F.

We learn from the last administrative report of the Indian Meteorological Department that the Seistan Mission has presented to that department meteorological records extending from June, 1903, to May, 1905, together with a note on the climate of Seistan by Colonel McMahon.

Another recent account of the climate of Seistan is that of Mr. Ellsworth Huntington, contained in Publication No. 26 of the Carnegie Institution, "Explorations in Turkestan, with an Account of the Basin of Eastern Persia and Seistan" (Washington, 1905), p. 227.

REPRINTS OF WORKS ON METEOROLOGY.

We have quite lately learned that the friends of science in Japan have taken steps toward the reprinting of the mathematical works of Prof. Dr. Diro Kitao, professor of physics in

the Imperial University at Tokyo. His works include not only a memoir of 400 pages on the motions of the earth's atmosphere, but also an important paper on the movement of water in the soil, as affected by pressure, evaporation, capillarity, etc. This latter is undoubtedly the most extensive theoretical memoir ever yet published on the subject, and is accompanied by tables based on experiments, so that Kitao's results are applicable to all kinds of soils. As Kitao perfected his education in Germany, and was for a long time a pupil of Helmholtz, his scientific papers have been written in the German language and published among the memoirs of the university. It is very desirable that they should be reprinted and made easily accessible to scholars thruout the world. As such reprinting is done very cheaply in Japan, it is to be hoped that many will subscribe for early copies of the complete work.

Meteorologists will be especially pleased to learn that a reprint of all the works of Prof. William von Bezold has been undertaken by a German firm, and copies can be obtained thru any importer. As this reprint will include many memoirs additional to those contained in the Editor's "Mechanics of the Earth's Atmosphere", it should come into the hands of every student of the physics of the atmosphere.

American students frequently inquire for the memoirs published by Prof. William Ferrel. Some of these were reprinted in 1882 as Professional Paper No. 8 of the Signal Service. His popular essays form Professional Paper No. 12, and his "Temperature of the Atmosphere" was printed in 1884 as Professional Paper No. 13. His paper entitled "Recent Advances" was an appendix to the Annual Report of the Chief Signal Officer for 1885, and his papers on the reduction of the barometer to sea level and on the psychrometric formula were appendices to the Annual Report of the Chief Signal Officer for 1886. But these are only a small part of his works on meteorology; three most important contributions were published by the Coast Survey and others in scientific journals. It would give a great stimulus to the study of our science if all these could be reprinted in a style as handsome as that adopted by the Carnegie Institution in reprinting the works of Doctor Hill. Written by the founder of modern dynamic meteorology, even tho Ferrel's works be eventually superseded, yet they will always be classics and in great demand, and will reflect credit on America. But an expensive edition is to be avoided, as his writings should be made accessible to every student.

The editor has fortunately been able to preserve an excellent set of notes on a series of lectures delivered by Ferrel in 1885–6 to the higher officials of the Signal Service. These notes are a simple presentation of some of the more prominent points in meteorology that interested him, and are apparently worth elaborating and publishing in the style so often adopted by German students as tributes to the merits of eminent professors.—*C. A.*

PREMATURE PUBLICATION.

Investigators, busy in the search after new facts or laws in nature, have very different habits as to the publication of their results, depending, of course, upon their respective personal characters and experiences. Some, for instance, rush into print at every opportunity and keep the scientific world stirred up with the frequent announcement of interesting results, suggested possibilities, or half-proven novelties. Others are more circumspect, and are so reluctant to publish that which may be criticized or annulled by some fellow student along the same line of work, that the world very rarely hears from them. Euler published a thousand papers, but Helmholtz scarcely a hundred of a technical character. Now it is true that the thousands of authors and the tens of thousands of papers that are treasured in the history of science have not all of them been of the first class. Most of them may be said to be now utterly forgotten, and yet each did some little good; and there is no reason to regret that the world has had such men and has read their works. Each honest man studies, experiments, talks, writes, and teaches in the hope that he may accomplish something worth while, and each must be encouraged to do his best. The multiplicity of journals and societies may embarrass the bibliographer and overwhelm the reader who would keep up with the progress of knowledge, but it is better that authors should write and publishers print, rather than that nothing be done, as tho the world had gone to sleep. There must be a beginning, and the progress of knowledge will always relegate the poorest papers to obscurity. One valued correspondent, recently withdrawing an excellent paper that he had prepared for publication, writes:

> It is a poor plan to publish uncertainties and thereby perhaps befog the truth for years, as has happened ofttimes heretofore. Now the matter of the earth's radiation to space involves so many doubtful quantities that I believe the less a man commits himself in print until some more experiments are made, the better he will like it hereafter.

We fully agree with our correspondent that the action of the earth's atmosphere on the radiation that comes to us from the sun, and on that which goes from us outward into space, is a matter that still needs elucidation, and we shall be very glad to print whatever he has to say on the subject No man can write on this better than he, and his errors, if any, will not befog, but clear away the fogs of error. On the other hand the subject has so many different aspects that one man can scarcely compass them all, and we therefore hope that other eminent physicists, with all the resources of modern laboratories, will take up some aspects of atmospheric and terrestrial radiation, since it is a fundamental problem of meteorology. In a general way we understand that Langley, Abbot, and others have been able to demonstrate that the moist atmosphere exerts both a general absorption of all solar rays, and a special absorption of specific wave lengths. We may summarize this by saying that as to general absorption by the air all the shortest waves are wholly absorbed, the visual waves are partly absorbed, and the longer waves are slightly absorbed, except in the regions of special total absorption by water vapor, ammonia, carbonic acid, and other vapors, which regions, however, grow more and more extensive and profound as the wave length increases. We presume that by analogy we may also infer that the long wave radiation from the earth's surface is well-nigh extinguished by its absorption by the water vapor of the atmosphere, so that the radiation to space from the earth as a planet takes place almost wholly from the upper strata of its water-bearing atmosphere.

The preceding paragraph seems to be almost equivalent to the following statement by Abbot, who says that the idea that the earth's atmosphere is transparent to long wave lengths—

> Is certainly contrary to fact, as shown by the bolographs of the solar spectrum, which exhibit no energy to speak of in the water vapor bands; and also by the work of Rubens and Aschkinas, who show that much less water vapor than is present in the atmosphere is enough to completely absorb nearly all the range of wave lengths which the earth emits. This strong absorption of the earth's radiation must keep its surface warmer and more uniform in temperature than it would be otherwise, for the water equivalent of the atmosphere is not inconsiderable, and it must take some time to warm it by the absorption of the earth's radiation, and any covering that checks the escape of the heat must augment the temperature of what it covers. Hence I do not agree that the "outcome is the same in a general way", and I feel sure that the atmosphere is not transparent to long wave lengths.

These statements harmonize in a general way with most of the thermal phenomena; and yet they are but broad generalities when contrasted with all that we wish to know about terrestrial radiation. Much greater precision must be given to our ideas before we shall be able to explain or predict the formation of frost, cloud, hail, and the phenomena of storms from a mechanical point of view. The thermal phenomena of the atmosphere can be elucidated only by combined experi-